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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHAUHAN, ULKA J	
ART UNIT	**PAPER NUMBER**
2676	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/004,191	HOCHMUTH ET AL.	
	Examiner	Art Unit	
	Ulka J. Chauhan	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-9 and 11-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-9 and 11-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 4 and 10 are cancelled; claims 23-36 are newly added; and claims 1-3, 5-9, and 11-36 are pending.

Claim Objections

2. Claims 11 and 12 are objected to because of the following informalities: Claim 11 recites dependence from claim 10, which is cancelled by Applicant's amendment. For examination purposes, claim 11 is assumed to correctly recite dependence from independent claim 9. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3, 5-9, 11, 13-22, 26, 27, 32, 33, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over B. Schmidt, M. Lam, and J. Northcutt. The Interactive

Performance of SLIM: A Stateless, Thin-Client Architecture. In *Proceedings of the Seventeenth ACM Symposium on Operating Systems Principles.* Vol. 33 Issue 5, December 1999, pgs. 32-47 (Schmidt) and U.S. Patent No. 5,974,471 to Belt.

6. As per claims 1 and 5, Schmidt teaches a thin-client architecture comprising:

a display network interface operable to receive graphics image data of an image over a communication network; a display frame buffer operable to store said received graphics image data; and a display refresh unit operable to read said stored graphics image data from said display frame buffer, said display refresh unit further operable to display said image on a display unit (*a thin-client architecture in which raw display updates are transmitted over a network to display devices [pg. 34 sec. 2.1]; The display consoles of the architecture receive display primitives, decode them, and send the pixels to the graphics controller [pg. 35 sec. 2.3]; The consoles comprise a network interface, frame buffer, and peripheral I/O [pg. 34 sec. 2.1 and pg. 35 sec. 2.3]*).

Schmidt does not expressly teach a display decompression unit operable to decompress said graphics image data prior to being stored. Belt teaches a computer system with distributed compression and decompression wherein the network interface controller 124 and multimedia devices each include codec logic 172 [Fig. 1] which performs compression and decompression operations such that data is compressed before being transferred and the received compressed data is decompressed before being stored or used [Abstract]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the distributed compression and decompression in the form of codec 172 within Schmidt's consoles in order to

decompress received data that is transmitted in compressed form for increasing efficiency and conserving transmission bandwidth.

7. As per claim 2, Schmidt discloses a display network interface port coupled to said display network interface, said graphics image data being received over said communication network via said display network interface port (*consoles coupled to the interconnection fabric implicitly teaches network interface port, and consoles receiving 2D pixels over the interconnection fabric [Fig. 1]*).

8. As per claim 3, Schmidt discloses that the display network interface port is selected from the group consisting of an Ethernet port, an Infiniband port, and a wireless network transceiver (*10/100 Base-T Ethernet connection [pg 34 sec. 2.1]*).

9. As per claim 6, Schmidt discloses graphics image data being part of a plurality of packets received from a remote source device (*UDP/IP transmission between servers and consoles [pg. 35 sec. 2.2.]*).

10. As per claims 7 and 8, Schmidt discloses wherein said remote source device is a graphics adapter or a graphics appliance (*In the SLIM architecture, all processing is performed on a set of server machines [pg. 35 sec. 2.4]; executing real-time applications such as video or 3D-rendered games [pg. 44 sec. 7]*).

11. Claims 9, 11, 13, 15, 16, 18, 19, 20, 26, 27, 32, 33, and 35 are similar in scope to claims 1-3 and 5-7, and are rejected under the same rationale.

12. As per claims 14, 21, and 36, Schmidt does not expressly teach decompression being performed at a rate at least as fast as a rate at which said image is being displayed on said display unit. Belt discloses that the distributed compression and decompression logic for compressed

data movement improves efficiency for data transfers and increases the performance of real-time applications [c. 2 ll. 40-47]. Therefore, Belt implicitly teaches that decompression rate at least equal to the display rate.

13. As per claim 17, Schmidt does not expressly teach that the network interface port comprises an Infiniband port. As is well known, Infiniband is an I/O interface that merges the work of NGIO (Next Generation I/O) and Future I/O. As the demands for high bandwidth and low latency in computer technology increases, the emerging InfiniBand architecture is being developed by the information industry. InfiniBand architecture de-couples an I/O subsystem from memory by utilizing point-to-point connections rather than a shared bus. InfiniBand products are ideally suited for clustering, I/O extension, and native attachment in many network applications and can be used in high-performance server applications, providing a cost-effective transition from existing technologies. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented an Infiniband port in Schmidt's architecture in order to take advantage of greater bandwidth and expandability of the Infiniband port.

14. As per claim 22, Schmidt teaches a display consoles [Fig. 1]. Computer systems such as a typical desktop personal computer (PC) or workstation generally use a display monitor such as a cathode ray tube (CRT) or Liquid Crystal Display (LCD).

15. Claims 12 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over B. Schmidt, M. Lam, and J. Northcutt. The Interactive Performance of SLIM: A Stateless, Thin-Client Architecture. In *Proceedings of the Seventeenth ACM Symposium on Operating*

Systems Principles. **Vol. 33 Issue 5, December 1999, pgs. 32-47 (Schmidt) and U.S. Patent No. 5,974,471 to Belt and U.S. Patent No. 5,936,616 to Torborg, Jr. et al.**

16. As per claims 12 and 34, Schmidt does not expressly teach graphics image data and said decompressed graphics image data being store in different portions of said display frame buffer. Torborg teaches a display controller that maintains a shared memory 142 comprising both a decompressed cache (VFB cache) used to store a decompressed portion of the frame buffer, and compressed memory used to store compressed subregions of the frame buffer [Fig. 6 and c. 9 ll. 39-43]. The invention provides the advantages of reducing memory requirements in computer display architectures because the display image is stored in compressed form, and reducing the memory bandwidth required to access the display image since it requires less bandwidth to transfer compressed data as opposed to decompressed data [c. 3 ll. 14-22]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented the console frame buffer as comprising both compressed portion and decompressed portion as taught by Torborg in order to conserve storage and reduce memory bandwidth as taught by Torborg.

Claim Rejections - 35 USC § 102

17. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

18. Claims 23-25 and 28-31 are rejected under 35 U.S.C. 102(b) as being anticipated by B. Schmidt, M. Lam, and J. Northcutt. The Interactive Performance of SLIM: A Stateless,

Thin-Client Architecture. In *Proceedings of the Seventeenth ACM Symposium on Operating Systems Principles*. Vol. 33 Issue 5, December 1999, pgs. 32-47 (Schmidt).

19. As per claim 23, Schmidt teaches a thin-client architecture comprising:

a display network interface operable to receive rendered graphics image data of an image over a communication network; a display frame buffer operable to store said received rendered graphics image data; and a display refresh unit operable to read said rendered graphics image data from said display frame buffer, said display refresh unit further operable to display said image on a display unit (*a thin-client architecture in which raw display updates are transmitted over a network to display devices [pg. 34 sec. 2.1]; The display consoles of the architecture receive display primitives, decode them, and send the pixels to the graphics controller [pg. 35 sec. 2.3]; Multimedia applications typically render directly to the frame buffer [pg. 44 sec. 7]; The consoles comprise a network interface, frame buffer, and peripheral I/O [pg. 34 sec. 2.1 and pg. 35 sec. 2.3]*).

20. As per claim 24, Schmidt discloses a display network interface port coupled to said display network interface, said rendered graphics image data being received over said communication network via said display network interface port (*consoles coupled to the interconnection fabric implicitly teaches network interface port, and consoles receiving 2D pixels over the interconnection fabric [Fig. 1]*).

21. As per claim 25, Schmidt discloses that the display network interface port is selected from the group consisting of an Ethernet port, an Infiniband port, and a wireless network transceiver (*10/100 Base-T Ethernet connection [pg 34 sec. 2.1]*).

22. As per claim 28, Schmidt discloses rendered graphics image data being part of a plurality of packets received from a remote source device (*UDP/IP transmission between servers and consoles [pg. 35 sec. 2.2.]*).

23. As per claims 29 and 30, Schmidt discloses wherein said remote source device is a graphics adapter or a graphics appliance (*In the SLIM architecture, all processing is performed on a set of server machines [pg. 35 sec. 2.4]; executing real-time applications such as video or 3D-rendered games [pg. 44 sec. 7]*).

24. Claim 31 is similar in scope to claim 23 and is rejected under the same rationale.

Response to Arguments

25. Applicant's arguments filed 11/1/04 have been fully considered but they are not persuasive. With respect to amended independent claims 1 and 9, Applicant argues that Schmidt does not disclose or even suggest a display decompression unit coupled to the display frame buffer and operable to decompress the graphics image data. Claims 1-3, 5-9, and 11-14 are rejected as unpatentable over the combined teaching of Schmidt and Belt. Belt discloses a codec logic within a network interface controller 124 and multimedia devices [Fig. 1] that compresses data before transferring and decompresses received compressed data before storing [Abstract]. It is argued that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the distributed compression and decompression in the form of codec 172 within Schmidt's consoles in order to decompress received data that is transmitted in compressed form for increasing efficiency and conserving transmission bandwidth.

26. With respect to claim 15, Applicant argues that Schmidt appears to teach away from the proposed combination of references as suggested by the Examiner at least because Schmidt

appears to simplify the console by placing all data processing at the server and transmitting only display primitives to the console, in contrast to the Examiner's suggestion that additional processing be added to the console. However, Schmidt is also concerned with bandwidth allocation by the console to different multimedia applications [section 7]. Implementing a codec as taught by Belt, in combination with Schmidt's consoles would increase the bandwidth available for allocation. Therefore, Schmidt does not teach away from the combination of Schmidt and Belt.

Conclusion

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ulka J. Chauhan whose telephone number is (703) 305-9651. The examiner can normally be reached on Mon. through Fri., 9:30 a.m. to 4:00 p.m.

28. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (703) 308-6829. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

29. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ulka J. Chauhan
Primary Examiner
Art Unit 2676

ujc
February 17, 2005